DOCUMENT RESUME

ED 032 668 EC 004 222

1968 Summary Report: Implications for the Use of Television in Schools for the Deaf.
Tennessee Univ., Knoxville.
Pub Date 68
Note-47p.
EDRS Price MF-$0.25 HC-$2.45
Descriptors-*Audiovisual Aids, *Aurally Handicapped, Broadcast Industry, *Broadcast Reception Equipment, Closed Circuit Television, Copyrights, *Educational Television, Engineering Technicians, Engineering Technology, *Exceptional Child Services, Production Techniques, Program Planning, Special Schools, Televised Instruction, Video Tape Recordings

The report of a seminar for educators of the deaf on educational television considers sources of programs, copyright problems, cooperative agencies, and sources of financial support. A discussion of technology explores origination facilities and equipment, distribution systems, display systems and special considerations, videotape compatibility, the implications of color, and portable and special equipment. Descriptions of programs utilizing television are presented by the National Technical Institute for the Deaf, the Arkansas School for the Deaf, and the Tennessee School for the Deaf. Suggestions pertinent for program planning are included. (RJ)

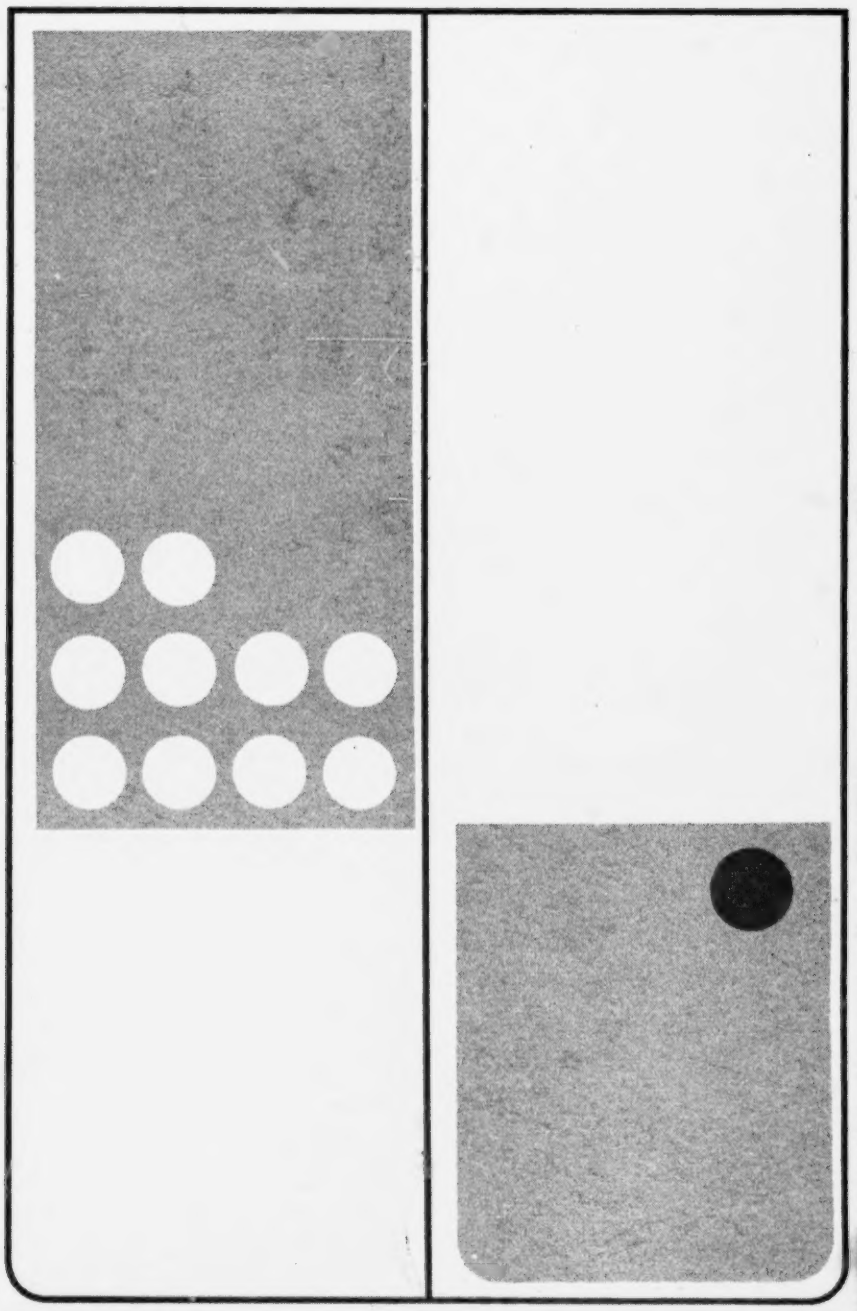
ED0 32668

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

1968 SUMMARY REPORT

IMPLICATIONS FOR THE USE OF TELEVISION IN SCHOOLS FOR THE DEAF



SOUTHERN REGIONAL MEDIA CENTER FOR THE DEAF

EC 004 222

FOREWORD

A short video taped presentation at the Symposium on Educational Media for Teaching the Deaf in Lincoln, Nebraska, in February 1968 elicited so much national interest among deaf educators that this seminar was set up as a means of delving more deeply into some of the concerns associated with utilizing television in education of the deaf population. The seminar was organized to focus attention on three major areas:

1. Programs -- where do we get the television programs and what are the sources of know-how and financial support?
2. Planning and preparation -- how do we get started?
3. Basic Technology -- what kind of equipment do we need?

Answers to these and other questions must be found before the first equipment item is purchased.

Educators of the Deaf are endlessly searching for new and more flexible educational procedures and tools that will reduce the isolation of deaf people and bring them into the mainstream of life as knowledgable and effective citizens. Television has exciting implications for deaf education. Let's quit talking about change without actually changing.

William D. Jackson
Director
Southern Regional Media Center for the Deaf
University of Tennessee
Knoxville, Tennessee

TABLE OF CONTENTS

Chapter		Page
I.	PROGRAMS	1
	Sources of software	1
	Copyright problems	5
	Cooperative agencies	6
	Sources of support	7
II.	BASIC TECHNOLOGY	9
	Origination facilities and equipment	9
	Distribution systems	18
	Display systems and special considerations	25
	Videotape compatibility	26
	Implications of color	26
	Portable and special equipment	27
III.	PRESENT UTILIZATION OF TELEVISION IN DEAF ED	31
	National Technical Institute for the Deaf	31
	Arkansas School for the Deaf	34
	Tennessee School for the Deaf	36
IV.	PLANNING AND PREPARATION	38
	APPENDIX	

1. PROGRAMS [1]

Sources of Software

The first major source of programming for an educational television station is NET (the National Educational Television network.) The total number of NET affiliates in the United States, Puerto Rico, and Samoa now exceeds 140 broadcast stations. There are two ways to secure programs from NET. As an affiliate, you pay an annual membership fee and receive their "fixed service." You must run five hours a week in prime time for an adult audience including three programs on public affairs and three programs on cultural affairs. The reason this is called a "fixed service" is that you do not deviate from the schedule given you by NET. They say that this is your choice, but in reality you have no choice at all. The second way to have programs from NET is called the "flexible service." You sit down with a field representative and go through a catalog containing two or three thousand different program series to select those you believe would best meet the needs of your community. For example, the educational station in the Knoxville area (WSJK-TV) runs 35 programs a week for adult audiences and 20 of these come from NET -- 6 programs from the "fixed service" and 14 from the "flexible service."

The second source of bulk programs is ETS (the Educational Television Stations program service, a division of the National Association of Educational Broadcasters.)

---

[1] Summary of presentation by Mr. Dale Ouzts, Station Manager, WSJK-TV, Knoxville, Tennessee.

You first have to join the National Association of Educational Broadcasters, then secure programs in a way similar to NET's flexible service. From the approximately eight hundred program series in the ETS catalog, you select the program topics you would like to use, book them individually, and pay per program. So you are charged according to the number of programs run, and you can work it into your budget.

As a third source, each station has a regional network --- either working or "up-and-coming." The Southeastern regional network falls in the "up-and-coming" category. Incorporated last January in Columbia, South Carolina, SECA (the Southern Educational Communications Association, Inc.) is very new and currently has one program series, but eventually 14 Southeastern states will be connected in- to an instantaneous network.

The next major source of programs is a state network. Tennessee's educational television network (TETN), like the regional, is still in the planning stages with four stations currently operating, one of which is Channel 2 in Knoxville. We can barter programs on a no-cost basis with other stations in the State system. Having been on the air only a year, however, we have had very little to offer the older stations in return for a promise of sharing our programs when they become available. We are very happy with the situation and already have sent programs to sister stations in the state.

There is another minor source which should be mentioned. If we find a program

series which we really would like to run on our station and it's not listed under NET or ETS or available from the regional network, then we contact the individual station. Currently, for example, we are running a weekly program series produced by Auburn University for which we pay a set price of $5 per program. In response to the demand for a good program on mental retardation, we contacted a station in New Hampshire and secured a recommended program at a cost of return postage only. Programs are available at a very nominal fee if you look long enough and hard enough.

The last major source from outside the station is what is commonly referred to in the industry as "free film service." Some broadcasters laugh when this is mentioned. Each week through the mail approximately 25 films are received, varying from 3 to 200 minutes in length, in color or in black and white, and covering a wide range of topics from the growth of a child in central Africa to the scraping off of a tiger's claws. Usually the film is pushing a service or product for a company or corporation. Many of these films nevertheless, are done in good taste, use a soft-sell technique, and have informational and educational values for adult audiences.

The last source is our own production facilities. WSJK-TV and the University of Tennessee produced 8 of the 35 adult programs that we operate each week. Although this is a very small number, it is about as many as the average community or local station normally produces. We try to run the gamut in types and lengths of programs, ranging from current affairs and news analysis to medical self-help training. We actually are trying to fulfill community needs.

Adult or public education, however, is our secondary goal. The basic reason for Channel 2 in Knoxville even being on the air is our in-school service for 47 school systems in middle and East Tennessee. Schools in Virginia, North Carolina, and Kentucky are also using our programs until such time as equivalent services may be provided by their own states. All of the 37 series currently being run for day-time in-school use are being produced by our own or other Stated-owned ETV stations.

Still another source to be kept in mind for the future is the new "Corporation for Public Broadcasting." The corporation is in existence, but Congress has not yet appropriated funds for it. The CPB is authorized "to facilitate the full development of educational broadcasting in which programs of high quality obtained from diverse sources will be made available to noncommercial educational television and radio broadcast stations." Not only will CPB help us upgrade the quality of production, content, and all the other individual items that go into a good informational/educational program, the new corporation may also "make grants to program production entities, individuals, and selected noncommercial educational broadcast stations for the production of programs for national and regional distribution." Thus, noncommercial educational broadcasting stations such as ours may receive aid in financing local programming costs. The new corporation will also be responsible for establishing and maintaining a library and archives file of noncommercial educational television and radio programs. If this comes about, it will be very useful to many people in many areas. In deaf education, for example, you could write to

this central location for the tape you wish to use, caption it as desired, and keep it as long as needed.

Copyright Problems

There has been no major change in the copyright bill since 1909, so most borad-casters feel that it is a little bit outdated. The new copyright bill[2] presently before the Senate, however, if passed as it now reads, will impose severe restrictions on educational television. Educational broadcasting has received almost blanket clearance in the past, but apparently educational television's recent prosperity and publicity have caused many of the major companies to want additional payment for materials used. The new bill as it now reads would require a separate negotiated contract for each audiovisual item used in a copyrighted program; if this comes about, it will be absolutely necessary to streamline and standardize contracts and procedures to speed up copyright clearances. It has been estimcted that added clerical and legal personnel for each individual educational television station in the nation would cost $52,000 a year just for clearance of copyright. Other major proposed limitations being fought by educational broadcasters include the following: the radius of transmission of broadcast must be less than 100 miles; no more than one recording of a program can be made and this copy must be destroyed after one year (one copy can be made solely for archival purposes); all broadcasts must be designed

---

[2] House of Representatives Bill No. 2512(already passed) and Senate Bill No. 597.

primarily for reception in classrooms or by persons whose disabilities or other special circumstances prevent their attendance in a classroom; and the program must be a formal part of a school curriculum. An amendment passed by the House would free instructional broadcasts (those which are an integral part of a formal curriculum in a school system) from the 100 mile limit and also from the one-year erasure date; if this amendment is passed by the Senate, only what we term "public television" (the adult programs) would have to be cleared under the new copyright bill -- but even this will cost each station an additional $15 - $18 thousand per year. As stated by an ETS official, "ETV and all educational broadcasting will be hurt by the bill as it now stands." In effect, the problems envisioned under the proposed new copyright bill fall into three headings: (1) clearances for instructional television materials, (2) the daytime in-school courses, and (3) public television clearances for adult education.

Cooperative Agencies

In each community there are many agencies that would be helpful if requested. High on the list should be placed resources of the major colleges and universities (for instance, the Southern Regional Media Center for the Deat at The University of Tennessee), the smaller community colleges and the public schools. The local, state, and federal governments, of course, are very helpful in many ways. Industries in your own local community have the money to do

the things you want done and often will be glad of an opportunity to help. The responsibility falls on you to approach them.

Sources of Support

For educational television the major source of money in the past several years has been the ETV Facilities Act; this source, however, is running out and proposals are not longer being accepted. The new Corporation for Public Broadcasting was planned as a replacement, but Congress has not provided funds. Under the Elementary and Secondary Education Act of 1964, funds are available for antenna systems, receivers, and other equipment (Title I), for library and audio-visual materials (Title II); and for regional development (Title III).

Q: How will the proposed new copyright law cover use of copyrighted material on the in-school, closed-circuit television system?

A: The new copyright bill will be much, much more strict than the current one.

Q: How can we as educators help in the legislation?

A: Get as many people as possible personally involved. Write every member of Congress and have everybody in the school system write every member of Congress, because the people who represent you in Congress need to know your views. We hope that by the time it hits the floor the people who make the laws of our nation will be better informed as to what the new copyright law is going to do to the communications systems.

Q: Who determines the program schedule for NET and SECA, and how can we influence these people to put the programs into their catalogs which might be captioned for deaf education?

A: Get the local station to cooperate with you. If the program is good, both in production quality and content, then it can be submitted and picked by NET, ETS, SECA, and so on. At the same time, voice your opinions to NET and SECA. Let them know that you feel there is a need for more programming for the deaf portion of the audience.

Q: Why have none of your programs been captioned?

A: We were unaware of the needs of the deaf population. In the future, more and more will be captioned.
(COMMENT: If we want this kind of programming, we are going to have to produce the software or at least the technical know-how from the standpoint of the educators. We can't expect the broadcasters to have it.)

Q: Would you speak on the copyright problems of taping material from a commercial station and using it for educational purposes?

A: Even under the current copyright bill, it would be illegal to duplicate broadcasted material. I'm not up-to-date on it.

Q: You mean to tell me that if your station put on a good lesson in science I couldn't tape it, store it, and use it sometime in the future?

A: Not if I had copyrighted it. You would have to pay me to use it.

Q: If the school make a film on tape for its own use, it wouldn't necessarily be copyrighted?

A: If you originated it, in terms of your own staff, your own facilities, and everything, there would be no copyright problem.

Q: If a person makes a good educational program and does not copyright it, can he distribute it to other educators?

A: Yes, except that if it were broadcast he could only make one copy and would have to be certain that the copy was destroyed after one year.

II. BASIC TECHNOLOGY

Origination Facilities and Equipment [3]

I would like to start out by saying that the consideration of TV origination cannot be separated from its application. Concerning the special and unique requirements for television origination systems in schools for the deaf, I see no major technical differences associated with teaching the deaf or those with normal hearing. I can see great differences, however, in the manner which you apply the medium. Due to television's many inherent capabilities, great potential exists for its use in academic assistance of the deaf. However, the hardware supplier cannot be expected to develop these potentials for your particular needs -- you must develop them yourselves. We can only provide the tools -- you must apply them. Go out and invest a little money, play with the tools we can make available to you, but develop those techniques and programs which will accomplish your own purposes. Some of your projects might fizzle out, but others might prove so valuable to your training and educational processes as to cause you to re-evaluate your present programs.

Let me briefly describe a new capability which television offers but which is presently being used in a minimal fashion due to the costs. With a simple typewriter

---

[3] Summary of presentation by Norman R. Selinger, President, Video Engineering Company, Washington, D. C., "Television Origination System Considerations" (copyright 1968 -- used by permission.)

keyboard, captions or letters can be inserted onto a picture instananeously. Can you visualize taking existing motion pictures and converting them quickly and inexpensively into television format, inserting as many titles or captions as you desire and as frequently as you desire? No art work, no setup of the system. This is just one of the many features which television has to offer. Television is a highly useful and unique medium which extends the range of the human eye and ear. It combines all of the multi-media devices utilized heretofore for visual display. It utilizes the slide and film projector; it incorporates programmed instruction; it feeds and displays computerized instruction; it utilizes the audiotape and the videotape recorder. It expands the reach of the individual to one person or to one hundred or one million persons. It magnifies, standardizes, records, and critiques. It is utilized everywhere -- in industry, medicine, education, space and military programs. Its potential is a means of instantaneous providing, recording, and playing back both picture and sound from one little room to the whole universe. Television can be used in lieu of any other media because of its ability to be easily utilized by any layman to produce the simple picture and sound and because it is the only medium where you can hear and see exactly what is being recorded and instantaneously know that it in fact was recorded. It is much less expensive than film to produce and, unlike film television recordings, can be erased and resued many, many times. Unlike all other graphic devices, it can be many places at the same time with only one origination point to be controlled.

Because the subject of equipment and application is so complex, no two TV systems are alike. When you venture into the utilization of this marvelous and resourceful new medium, television, your first consideration must be to find a qualified and competent video engineering firm whose advise is based upon consideration of your requirements, both present and future. In logical sequence, then, the selection of the components comes only after your overall program has been analyzed. Many well-intentioned people have based their purchases of television equipment solely upon cost or the novelty of seeing their first real live television camera or tape recorder, only to find out that none of the equipment could be utilized in their overall, longrange programs. One major university, for example, purchased bits and pieces of television equipment over a span of two years before finally coming to my firm for assistance in utilizing these purchases. After examining their requirements, we discovered that out of $25,000 expended for equipment only $6,000 worth could be compatibly utilized due to the fact that none of the equipment was compatible with broadcast studio configuration. Even though they had carefully planned the software phase of their longrange program, they had neglected the technical considerations.

When studios or systems are designed, besides meeting the technical broadcast requirements, the equipment has to meet certain physical requirements which are considered when designing and human engineering the control room console and studio. This is the function of your systems engineering company: to help you put

together the goal, plan your ultimate requirements, and then work out a program of progressive purchasing toward that eventual goal. By careful planning you can be in business with your first purchase. It might be only a professional self-contained camera which might ultimately wind up as your film chain camera; or it might be a viewfinder camera which, incorporated with a second when funds become available, can become your studio camera. The two viewfinder cameras might eventually be incorporated into the first section of your control rack and made into a mobile console equipped with all the supporting equipment for a two-camera chain. This program can go on indefinitely until you finally wind up with a fully equipped, professional television studio. But I must impress upon you that none of this can be accomplished unless a full-scale technical systems plan has been prepared before you expend your first dollar.

What TV system is right for what you want to do? The TV systems break down into three main categories. The simplest type consists of one camera and a monitor or two whose purpose is to enlarge particular segments or components of the instructor's material so that all students in the room can observe it simultaneously. There are certain uses for which television is admirable suited in this simple system -- and certain misuses. A proper use is for magnifying a small object or for microscopy, or to magnify and emphasize formulas, or to expand the horizon of the ordinary chalk-board, or to magnify and display a photograph. Never try to use it simply to magnify a printed page. I have seen experienced teachers use television simply to transmit a

picture textbook material -- what a waste of the medium! Look upon this first type of system simply as a way of magnifying parts of your material. In fact, you may wish to use it for only a minute or two during a regular class period.

The second and third types of TV systems are designed to transmit their pictures somewhere, either instantaneously or simply into a videotape recorder. Both must accommodate picture and sound. The second type is generally the packaged mobile system including one or two cameras (either self-contained or low cost viewfinder cameras) and an audio system with one microphone. Sometimes a videotape recorder is built into the console. Usually the console includes a tabletop work surface and one or two preview monitors so that the instructor can not only see the picture going out but also preview the picture prior to switching. Some of the packaged systems contain elevator columns with a TV pan head whereby the camera may be pointed down to pick up pictures of opaque material or instructor's notes on the work surface. Some consoles contain a ground-glass screen with underlighting permitting pickup of transparencies by the camera. The equipment furnished with this type of a system can be selected to fit the user's application and it can be either industrial or broadcast quality. The packaged system concept offers much greater flexibility than the simple one-camera system previously described since programs with continuity and interest can be produced. Quality is primarily a product of the equipment selected and the software preparation and presentation.

The third type of television system is the complete TV studio. With a properly designed TV studio you can do almost anything you need and desire, combining into a composite production all of the sources of program originations: off-the-air from your local commercial stations or educational stations, cable feeds from the networks or local educational TV station or CATV system, film chair (slide and motion picture projectors), television tape recorders, or live programs produced in your own studio. As more and more appurtenances are added, the design criteria become more complicated and more supporting components must be added to make the entire system function properly. In the simple system we only had to concern ourselves with the camera and monitor. But in the complex studio with special effects capabilities, faders, dissolvers, title inserters, and many cameras, much more care must be taken to see that all components will work in harmony with each other. The professional television studio adds many technical capabilities required and desired to produce a television program which will retain the attention of the audience for long periods.

Television systems can cost as little as $500 or as much as $1,000,000. The average educational television production center costs between $50,000 and $100,000. The next question is, where and when does television help most efficiently in the learning process? No one has more than part of the answer to that question. We do know, however, that some things go well over the medium and others do not. So far today I have talked mostly about farily abstract concepts --

and I have used television to illustrate the details that go to make up some of the abstractions. That is a perfectly valid use of TV, but there are things that TV does even more efficiently. For example, the different styles of sign language could probably be illustrated more exactly, and uniformly, and less expensively through television than any other media. TV helps to set a standard which can always be utilized by teachers all over the country. In addition, television assures that every pupil will have received the program in the desired period. There is no possibility of instructor failure. TV is exceptionally good at teaching anything that involves physical actions or requires the description of spatial relationships. Generally it is hard for all students to see action at the same time -- or else, once is not enough, and it is more clear when seen a second time off videotape. Now, I cannot tell you what courses would be most efficiently taught by TV. Certain aspects of certain courses are more amenable to treatment by television than others. Thus, it is better to try to teach those parts of a course which are most efficiently presented by TV than to try to teach the course entirely by this medium. With large groups of students, the TV teacher is closer to his student than the classroom teacher because everyone can see his face, hear his voice, see what he is illustrating, and talk back to him with a talk-back system.

Another means of direct teacher-student relation is the use of student response systems. At his desk each student has a little switchbox containing three or four selection buttons so that when the TV teacher makes a statement or asks a question,

the student simply depresses the button which most closely responds to the inquiry. With this innovation the TV teacher is immediately able to observe the average response, know whether his students understood the material just presented, and decide whether to continue or to review the same problem. In addition, he has a recorded indication of each student's response for later individual analysis. Do you think a student can fall asleep under these conditions without the instructor's knowing?

Certain things, of course, limit TV in the technical sense, such as lighting conditions and proper lenses. The technical capabilities of TV affect your subject matter and its handling will dictate the design of the system to a great degree, or at least they should. We can actually design a TV system that will do anything and everything the state of the art is capable of. However, you will get more for your money if you analyze your subject matter first from four standpoints.

Ask yourself:

What have I got to do that

1. is concrete, rather than abstract?
2. is moving, rather than still?
3. needs to be repeated for best learning?
4. should be seen by more people than I can get into a classroom at one time?

Have the answers reasonably well in mind before counsulting a TV system designer.

The designer can help you a lot, but remember he is not an educator and therefore not qualified to make value judgements that are better left to the educator. It has been my experience that when TV has fallen short, it has not been because of the nature of the medium, but because those using it had little idea of what that nature was and how to take advantage of it.

One of the surest ways of insuring that your TV productions are going to be successful is to secure the services of a qualified TV director -- not one fresh out of school with a bachelor's or master's degree, but one who has had several years of experience directing and producing television programs. If funds are a problem, try to moonlight one from your local commercial station, for he can be very instrumental in starting you off in the right direction no matter how simple or elaborate your equipment may be. Remember, the equipment can be only as good as the people who use it. You should also bear in mind that maintenance is a continuing operating function to be calculated for and anticipated. Try to break your subject matter down into manageable components to see which are most efficiently done on TV and which are less. Try to draw up a couple of tentative schedules of televising and decide whether you want merely to reinforce classroom work with bits and pieces of systems or whether you may need a central origination system. Mull all that over and cut it up again -- then see a system designer. Remember that quality is better than quantity and less expensive in the end.

Distribution Systems[4]

Television distribution is usually thought of in terms of wires and cables, but distribution has many aspects. Distribution as we have come to know it is a direct result of the first and original form -- distributing television signals from a point of origin to various points of reception. Television distribution by means of broadcast is still an important and integral part of the overall picture of television, quite aside from the reception of television signals from your local commercial or educational open-circuit transmitters. One of the things that many people forecast will write the end of regular television broadcasting is direct satellite communications. A great deal of thought is being given to the possibility of evolving systems whereby these satellites will be capable of broadcasting directly into homes and institutions without having to go through network facilities.

In the broadest sense, the videotape technique of recording a television program for playback is in itself a form of distribution which is used fairly extensively. Totally apart from wires and cables, the procedure described earlier by Mr. Ouzts whereby taped information is acquired and transported around the

---

[4] Summary of presentation by Mr. Lewis Pfau, President, Signal Engineering Company, Birmingham, Alabama.

country constitutes a form of distribution commonly referred to as "bicycling." Another concept that has received extensive recent publicity is electronic video recording (EVR, not to be confused with VTR). This techniques is still in the developmental process, but is reported to offer some rather profound possibilities for distribution in the bicycling sense in that signals very much like videotape signals can be put on regular motion picture-like film in cartridge form and duplicated quite inexpensively. It has significant promise because it is color compatible at nominal expense, and I think that ultimately it will have a big role to play. Very early in the development of television it became evident that there was a need to be able to see a picture in several places throughout a building, throughout a community. Out of this grew a new industry. And it was really a two-faced industry, one oriented toward a whole community and the other toward buildings. MATV (master antenna television) systems generally are those in which signals are to be conveyed within a building or an institution. CATV (community antenna television) techniques have been developed to serve whole communities and have become a tremendous business involving a great many major companies and a very tender political issue. Now, people in education are particularly interested in the means of conveying television signals from point to point -- the wired systems. The concept of distributing pictures over cables from one central receiving point to all other buildings on the campus is a minature CATV system. Once it gets out of one

building, it's out of the classification of MATV. It is also what is known as a "RF (radio frequency) system," and radio frequency (or "carrier") waves are what television stations broadcast. The differences between video and RF are these: Video distribution relates to the propagation of signals in the form that they come out of the devices -- the cameras, the videotape machines, and so forth -- and generally is utilized for limited distribution not involving great distances. RF distribution deals with the transmission of television signals in the same form that they are transmitted by the stations on cables on recognizable television channels. The principal advantages of the RF distribution system are the channel versatility and the fact that it fan be utilized with regular television receivers. There are many types and combinations of video and RF systems.

Wire is the essence of distribution, but not just ordinary wire. The kind you might have seen around your house is a "twin lead" type cable, but the type usually employed in TV systems is called the "coaxial" cable. Coaxial cables are in use universally in all types of video and RF distribution systems although their characteristics vary with the environment in which they are to be used and the nature and extent of the transmission signal -- whether it's going to be a short or long run, whether it is to be exposed or buried requiring mechanical protection, whether it is to be in conduit, and so on.

In planning for television systems, it is recommended that all systems be fully

capable of transmitting color television signals. Color television has not yet penetrated the educational television field to a great degree because of cost considerations, but the rapid technological advances in color production dictate at this time the installation of systems which will properly accommodate the reception of color television. Another major departure in the consideration of the design of television distribution systems relates to whether they are to be single or all-channel. Designers anticipate the need within the next decade for hundreds of individual information channels in order to accommodate all sorts of diverse educational television functions -- special tutoring, direct instructional telecasting into dormitories, and so on. It appears that ultimately most distribution systems will be the full spectrum, taking in all of the channels in the VHF spectrum and all the UHF channels.

Among the requirements placed on television distribution systems, particularly within buildings or groups of buildings, are "play back" or "feed back" accommodations whereby TV programs can be accepted and fed back throughout the system. Another concept that you will encounter in talking to systems people will be "conversion." Conversion is a technique whereby a television signal on a given channel is changed to another channel for any of several reasons -- to avoid the possibility of interference or to bring UHF stations down into the standard VHF range, for example.

In planning for the construction of new buildings, the importance of good professional guidance in providing for television distribution cannot be overstressed. The development of a television distribution system is not a random thing; it has to

planned very carefully because of the fact that the signal is dissipated slightly with each foot of cable and with each device inserted into the system and you cannot just run a piece of pipe here or branch off there at random and expect that this will work. There are several excellent sources of good engineering information. Two or three of the companies manufacturing MATV equipment maintain very competent applications engineering departments, and it is possible to bring your consultants directly into contact with the manufacturer's engineering department. Comparatively few people work extensively in both CATV and MATV, mostly because CATV is a community proposition and the involvement of cable TV people in institutional wiring is usually pretty limited. So, you may find it necessary, if you are in a campus situation, to bring in both ends. If you happen to get responsive proposals for the installation of systems, you will probably want assistance also in getting specifications. Specifications can be pretty terrible things when they are written by inexperienced people or by people who are trying to sell a specific product rather than a function. And, unlike the purchase of videotape recorders or television receivers or other items of apparatus which you are quite accustomed to buying for your institutions, when it comes to putting in a studio or a distribution system or any installation of this magnitude, laws in your state may be very rigid about the necessity of the installers being a licensed general contractor.

A final form of distribution not mentioned before is being incorporated by our

company in a system installation at UT-Martin. A studio is being installed to develop television signals which will then be transmitted by closed-circuit microwave, closed-circuit in that the signals are broadcast on channels which cannot ordinarily be received directly on conventional receivers. At the participating schools in this system (113 schools covering a wide geographic area), the signals are received at these microwave frequencies and converted back to standard television channels so that they can then go into distribution systems of the type just discussed and be presented on standard television receivers. Here, in a closed-circuit television distribution system, you see signals generated, originated at video, distributed within the studio, converted to RF microwave, broadcast, converted back to standard television format, distributed within the school buildings, and finally appearing on the TV receivers. And that's about a comprehensive a distribution system as you can come up with.

Q: As we put these out for bid, who would write the specifications? Would we have to hire an engineer to do it?

A: There are perhaps a dozen active consulting firms in this field across the country who are knowledgeable in the whole realm, and there are also excellent applications engineering departments, as I said, vested with some of the major manufacturers. If written by a manufacturer, the specifications should contain safeguards so that equivalent bids can be received from competitive companies, but they can still be held to professional standards of performance.

Q: Are there trade associations to whom one could apply for information of this sort?

A: The National Association of Educational Broadcasters has an engineering group which is available to members and nonmembers for this purpose, in Washington.

Q: Assuming that we would like eventually to caption on three language levels and add three channels to the present system, do you recommend planning for this initially or can it be added on very simply?

A: It definitely should be planned in the beginning. A system designed at least to accommodate the whole VHF spectrum is usually adequate in most situations. If channel crowding becomes a problem, then other apparatus can be added.

Q: Could you give us a general description of what you have installed here on The Tennessee School for the Deaf campus -- outlets, number of buildings, distances involved, and approximate cost?

A: We are carrying signals broadcast by four area stations, including one UHF station converted to a VHF channel for distribution. These signals are gathered by the antennas atop a tower and are processed and amplified to sufficient strength to be pushed into cables covering the whole campus perimeter. Cables go underground in a pipe trench until they emerge at a point where they can be joined to the pole structure. Approximately 3,000 feet of aerial cable hang between poles at the perimeter of the campus, then cables extend from these into the buildings and the inside wiring serves approximately sixty-six outlets. Numbers of outlets per building range from one to twenty. The number of outlets is not ordinarily a limiting factor. There are many systems with hundreds or even thousands of outlets.

Q: Could one go to a local motel having a master antenna system and get information on vendors in the community who might be qualified to do this kind of thing?

A: I think not, because installations in the large motels have been negotiated a long way off and handled by leasing companies and in the smaller motels the systems would not be up to the technical standards for institutional use. Military bases or major universities or again some of the better cable plants would be the best sources of information that would lead you to high quality local vendors.

Q: Suppose you had a closed-circuit television for your educational channels and you used a low band in daytime, would there be any problem in switching over to commercial in the evening?

A: If your equipment will not pass the whole group of frequencies, then you could not do this. That question cannot be answered without more intimate knowledge of the actual equipment. It would probably have to be a pretty old system, though, to have that limitation. In installing a system, it would not cost any more to have a system which could function both ways.

Display Systems and Special Considerations[5]

The video quality throughout your entire system is established by two things: resolution and shades of gray. Let me say something about resolutions. Have you ever seen a test pattern on television with a wedge of lines coming closer and closer to a center circle? The resolution comes when you stop seeing the division of the lines. "Resolution," then, refers to the smoothness of the picture. Video monitors, which give you picture information without sound, come in different sizes rangeing from 8 to 23 inches and cost $200 to $500. RF receivers, with both video and picture mixed, cost $100 - $400, and I would warn you to use caution before settling for the low bid. The number of receivers needed to cover your classroom depends upon what you want your students to observe on the screen. As a rule of thumb, I would say that you should allow about 1 foot back for every 1 - 1/2" of screen; in other words, with an 18" receiver or monitor, the last student should be seated about 12 feet back. But that still depends on the material shown, such as finger spelling, so there can be no fast and hard rule. A projection television unit for a large auditorium, with sweep reversal, will cost approximately $3,000.

---

[5] Summary of presentation by Mr. Matt S. Long, Jr., President, Long Engineering Company, Winston-Salem, North Carolina

Videotape Compatibility. The 1/2" videotape recorder can be likened to 8mm film, the 1" recorder to the 16mm film, and the 2" to the 35mm film results. A sixty-minute program on the 1/2" costs approximately $40 a reel; on the 1", approximately $60; and on the 2", about $75. Now, I can't play my A machine tape on my B machine because there is no industry standard at the present time; it took about seven years to develop a standard speed for the audio recorders, and I think we're about four to five years off in standardization of videotape recorders. If you are planning to feed a videotape recorder into a distribution system, buy a good one.

Implications of color. Color is a little more difficult to maintain and more costly to build, but it is coming to educational television and you might as well get ready for it. Let's look at a video monitor: $400 for black and white vs. $700 - $1,000 for color. Let's look at that RF receiver: $100 - $250 for black and white vs. $400 plus for color. Now let's look at what it takes to get enough lighting: in a typical 18' x 24' studio, about $3,000 for black and white vs. $5,000 for color. Back to the videotape recorder, color compatible units are already available, and you can buy a good 1" unit in black and white today for about $3,500 and later convert to color for about $1,000 additional. So, today, plan for the future. Plan to take full advantage of color. Be sure you provide for adequate studio lighting; you don't have to buy the lamps now, but provide enough power that you don't have to run in that extra conduit later on. Be sure your videotape recorder is color adaptable and your support equipment as compatible as possible. You were advised

in an earlier presentation to look into the distribution facilities to assure later capability to take care of color. But don't put off getting started. The challenge to you as educators of the handicapped deaf child is to do the best you can for him today! Are you going to accept the challenge of innocation? You are depriving your students of a great opportunity if you wait for color to be available at a more reasonable cost because many wonderful things in education are already being done with black and white.

Portable and special equipment. First, we should define the word "portable." Do you know what GI portable is? It has 4 handles on it and it takes 8 men -- that's GI portable. But here is a truly portable videotape recorder, priced at $1,250. Monitors vary in price according to size; an 18" one runs $200 - $250. A companion playback unit, if desired, costs around $800. Next, there is the GI portable recorder with two handles on it and two men, believe me. It has a monitor and a tripod and a cable and you'd have a camera on it, so that's GI portable. This same material can be placed on a cart, and you saw carts this morning, so I won't go into that. You can build your complete studio into a mortorized van, run out somewhere, hook into power, and do a great job. When you come back, you can take it out and move it into your studio if you wish. There is a broad category of portable equipment for television.

Now, special equipment. There are two or three manufacturers of the character generator, which is truly fascinating and costs from $7,100 to $12,000

for the storage device. The keyboard is about $525 to $750 additional depending upon your system; it's just like the standard typewriter and you can get special electronic symbols if you need them. Then there is the roll and crawl option for about $600 - $800. You know, it's like buying an automobile -- you never get away with the rock-bottom price because you always add that AM- FM radio, airconditioner, power steering, and so forth. Well, these are some of the things you may want to get. The line shift, so you can just blank out a while line and insert a new one, costs another $600 - $800. Now, we want it to go out pre-programmed so we get a paper punch and reader for another $3,000 - $4,000.

Here is something that I think is rather exciting. You have your television system, a nice studio and distribution system. But how well are your students achieving? Well, we're going to help them by installing a dial access system in the dormitories and classrooms. They dial 102, and here is the afternoon's football game and the announcer is saying "touchdown." It's captioned across there but they also saw the action and that means "touchdown" to them. They will learn this way. You can see the rather interesting implications of what is available technologically. To tell you about it, I should like to introduce Mr. Leonard Coble, who is Director of Training for Western Union, and with him Mr. Harold Remey.

Mr. Leonard Coble: In the Western Union Training Center in Chattanooga, we are engaged in the skilled and informational training of technicians for maintenance

of this professional equipment. Some of these people have just been employed, while others may have had up to 39 years' service and are about ready for retirement. It is quite a challenge to reach these minds without insulting the experienced man or going too fast for the new one. We must teach everything from basic theory to fundamentals of how electricity works through microwave transmission or computer switching. We happen to be involved in a system called "autodin," which Wester Union has installed for the government services and which is by far the most advanced system in existence for record communications. We had overhead projectors and the other latest equipment for audiovisual presentation, but we had the same problem faced by the typical teacher in trying to assure that we were getting across to our students. This problem led to the development of our "response system" with which you get a constant response because every student is required to answer every question, and you as instructor are visibly monitoring. If a single question is not answered properly, you know immediately who is not getting the information. And, after all, what is our primary objective in teaching? Not those who excel and get the answers correctly, but those who are struggling to get the information.

(DEMONSTRATION)

Mr. Ralph Combs: Several months ago Dr. Jackson asked us about the possibility of split-screen captioning whereby you would be able to split the screen coming off

the air with one signal and then with a live camera put the picture and caption together. There were times when I just did not know whether we could get the job done or not, but I have here a prototype of what we are working on and we already are able to split the screen horizontally or vertically for captioning. In the very near future we wxpect to be able to split it in the top corner, bottom corner, left, right, or middle, circle it, do just about anything you may want to do in deaf education. You can tape a program off the iar, insert captions live with the camera, and drive this information back through to classroom or dormitory. You will have a recorder, a camera, a monitor receiver, and another monitor to show the two signals together. We believe we will be ready within three months to make production of this and we feel honored to be able to make a contribution to your educational program.

III. PRESENT UTILIZATION OF TELEVISION IN DEAF EDUCATION

National Technical Institute for the Deaf[6]

We have in use equipment ranging from quadraplex tape machines right down to the very simplest camera recorder. Our plans include complete production of full television courses; compilation of a library for replay, for captioning, and so on; extensive use of television in our counseling program and group therapies; using it on an information retrieval system for our bookkeeping; and dial access work for study carrels -- pretaping lectures, adding captions and sign interpretation, and making them available to the students for pre- and post-lecture viewing as well as test review. Most exciting of all, we are getting completely involved in computerized multimedia instruction. We have a monstrous computer to which we are adding slide projectors, film, videotape, and so on, to develop a program using all these media. All systems developed for the computer will also be developed on a free-standing nature so that they can be removed and used in other areas or in other schools not having the computer facilities. Also, in order to utilize the computer fully, in the dormitories we will have digital boxes with lights enabling students to sign and talk with friends or staff in telephone booths equipped with video receivers and simple straight video monitor set-ups. We will be running effects into effects so that anything put on videotape will have

---

[6]Summary of presentation by Mr. Jon Rawleigh, NTID, Staff.

a sign interpreter as a corner insert and then wipe up from the bottom to add captioning. Another thing we are investigating right at the moment is the possibility of adding to existing tapes new information in forms of signing or captioning. Along with this we want to be able to alter a network signal off the air so that we can provide a complete educational environment, not only in the classroom but also in the dorms. We want to caption news programs. There is a great deal of interest among the hearing students on our campus for a TV club, but we want to hald off until our deaf students come in. The deaf and hearing students are going to be completely integrated both in classroom and dorms, and we feel that a TV club will offer an ideal situation for perfect interaction. Orientation programs for manual communication have generated far more excitement than we had anticipated, and we are going into other areas. This summer, for example, 45 faculty members from RIT will participate in a six-weeks course designed to orient them completely to the problems of the deaf. We are going to give them a concentrated course on manual communications and demand from them complete course outlines of all their lectures including very clear and concise objectives. Then we are going to make a videotape of each instructor on a course content and description. Following these attempts to get them completely familiarized with our set-up, our work, and our concentration on media, we will work with them on developing videotapes of their individual lecture sessions.

If you are new to TV, before you buy your first piece of equipment, buy

a man and let him plan. All over the country I have seen closets full of hardware just sitting there. Hardware doesn't make software -- somebody had to program the hardware to do it. Your men will save you money for years ahead. The equipment and the money will come. Don't be in a rush to dash out and latch onto something. First, know what your objectives are. At NTID we are committed nationally to improving education for the deaf. Now, we are going to try to gear up for all our programs and make them available. Also, we want to help all of you people in your various areas any way we can. If you have a problem or want some consultation, call us andwe will be glad to help you. If you need a program or if you need something captioned after we get set up, let us work with you. I would like to be swamped with calls so that I could go around and get more people to do the programming. There is a slide program available on NTID to illustrate some of the things we are doing, some of the areas and some of the goals toward which we are headed.

Q: What kind of "man" are we talking about?

A: If you have the money to go for a Ph.D. who has experience in television, fine. But in my opinion it is not necessary. I feel many excellent programmers and engineers in commercial stations are making terrible wages, are frustrated, and would like nothing better than to get out and into an area where they can do something technically good. I don't believe it necessary to go out and pay for a man who has an advanced degree in education. He will be working with people, not deciding the course content and developing the curriculum. His job will be to give you the mechanical, technical, and aesthetic know-how to make this program good and to make it fly.

Q: What kind of money are these people making in commercial television?

A: In my area a production director in a commercial affiliate station is making about $6,000. A good engineer in my area is making at most $8,000. This would depend on the area, certainly, but I think you need not go over $8,00 - $9,000.

Arkansas School for the Deaf[7]

To understand a little bit about what we are using, I think you should understand how our school is organized. We have an academic campus and a vocational technical campus. On the academic campus we have a lower school (sometimes called primary or beginning) for ages four to nine, the middle school for ages nine to fourteen, and the upper school for ages fourteen to nineteen. In addition, we have a vocational school and dormitories. Instead of a central distribution center, we have mobile television units. Since January, we have actually taped and used more than 75,000 feet of tape. For demonstration purposes here, we picked out different portions, used a camera to take pictures of them, and made one composite tape which I have brought along.

The use of TV in the instructional program is limited only by imagination, although its effectiveness as a teaching tool will be influenced greatly by the school philosophy and by the careful planning of teachers and supervising staff. In our school, we do not allow a teacher or a houseparent or anyone to use the equipment without one week's advance notice, because we want them to think about how they are going to use it and then justify it so that we can avoid hit-or-miss usage and assure that it

---

[7] Summary of presentation by Mr. Roy Parks, Superintendent

fits into the curriculum. The philosophy of the Arkansas School for the Deaf is that the child must have a reservoir of receptive language and extensive vocabulary concepts if he is to develop good expressive language. We believe that television offers potent teaching stimuli to assist us in implementing our philosophy, enables us to use a teaching technique of planned activity with personal involvement. The heart and sour of our whole program is that the learner must have experience, and we are rewriting our whole curriculum in terms of experiences and bringing in the language appropriate to the various levels. Even more important is personal involvement, because we believe that the child learns best when he is involved in the teaching-learning process. This is the philosophy behind our use of this equipment.

Television is an effective tool for the guidance counselor also. One of the needs pointed out by vocational studies conducted several years ago was that our students needed to be familiar with the great variety of vocations which are feasible for the deaf. They knew only the ones which were being taught in the schools. With television equipment, we can go into any number of industrial plants, banks, government installations, and businesses and bring back a reservoir of guidance material. Another area in which we use TV is public relations. We have put together various aspects of our school program and presented the tape before civic clubs and other groups. Some excellent science programs and dramatic presentations are available on educational TV, and we are working with the educational TV people on thirty productions for which they were awarded a grant. We will use our television

facilities extensively in our summer school, in an eight-week Head Start program for our beginning deaf children, and other special projects. Remember that these tapes I have shown were made by amateurs, but I believe you will agree that there is personal involvement and there is teaching. We think that we are getting considerable value out of our television facilities and that as we learn we will get more. We are anxious to go into the split screen, the circle and the caption, and the central distribution system when we get money and personnel.

Tennessee School for the Deaf [8]

At TSD we do not yet have videotape equipment or cameras. We started with the CATV system -- the cable anetnna system with the master antenna -- to provide our receivers in the classrooms and dormitories with the best possible signal. So, the distribution system is here, and we can add additional outlets at any time. For classroom instruction, we are using the ETV science and math programs in the primary department and a number of other programs at the upper-grade levels. Every morning our students see the news, the weather, and any of the special events that are on the Today Show. We also have access to documentaries and other special programs. Because of this capability for distribution into all of the departments, we

---

[8] Summary of presentation by Dr. W. Lloyd Graunke, Superintendent

realize that we have lots of possibilities. Recently we began experimenting with some of the equipment acquired by the Southern Regional Media Center for the Deaf which made it possible for us to take programs off the air or off the camera and do various things to make them more useful to the classroom teachers and dormitory personnel. We found that our teachers were very much interested in using television, but for many reasons the audio information was not adequate. This was when we began experimenting with several possibilities: split screen, captioning, and various kinds of techniques. What we did, all of us, was to develop the concepts of using these techniques. We have a demonstration tape to show what we think can be done with a rather modest investment in equipment which can be operated by untrained personnel.

IV. PLANNING AND PREPARATION

The following suggestions came out of three discussion groups in terms of steps to be taken in setting up and utilizing television facilities in deaf education.

Group A[9]

1. Most of us had not realized prior to this meeting the serious implications for educational television of the proposed new copyright law. It is vitally important that this seminar go on record as opposing the pending copyright legislation and urge that it be modified to provide freedom to use videotape materials in educational programs.

2. There was concern over how to identify competent technicians in our local areas for installation and maintenance of equipment. Mr. Pfau volunteered to give us local reference sources to whom we could go for names of qualified personnel.

3. Investigate the ordinances or laws under which ETV stations are established in your local communities. There may be something helpful to you therein.

4. Contact your local ETV personnel for assistance in solving problems and also in assuring maximum utilization of facilities.

---

[9] Presiding: Mr. Roy Parks
Technical Consultant: Mr. Lewis Pfau

5. Open avenues of communication with local industries for reciprocal exchange of materials and ideas.

6. In light of the many understandings developed during this seminar and the rapid technological advances in television, it is recommended that plans get underway immediately for another, larger meeting of this type.

Group B[10]

1. In preparing to utilize media and specifically television, first determine what it can contribute in the educational environment. Involve the teachers in these deliberations -- not just administrators, technicians, and media specialists.

2. Consider television as an aid to learning rather than as a teaching device, and orient your teachers to accept video technology as a means of enhancing and improving the learning experiences of children.

Group C[11]

1. For the deaf child, television can provide the visual repetition he needs to overcome the language barrier resulting from his auditory handicap. It can also reduce his isolation from events around him.

---

[10] Presiding: Dr. W. Lloyd Graunke
Technical Consultant: Mr. Matt Long, Jr.

[11] Presiding: Mr. Ben Hoffmeyer
Technical Consultant: Mr. Norman Selinger

2. We can expect to make mistakes as we take steps to adapt television instruction to the education of the deaf, but we must move ahead.

3. There are two basic systems utilized in education today -- the classroom approach and the master antenna or RF distribution system. In a residential school setting, it appears that both could be used to advantage.

4. Our close-knit association as educators of the deaf calls for national standardization and exchange procedures. Perhaps Captioned Films for the Deaf could lead in this development.

APPENDIX

PARTICIPANTS

Norman Anderson
Wyoming School for the Deaf
Casper, Wyoming

Jack Brady
Superintendent
Kentucky School for the Deaf
Danville, Kentucky

John L. Caple
Principal
Georgia School for the Deaf
Cave Spring, Georgia

Barbara Cashier
St. Joseph's School for the Deaf
Bronx, New York

Edmond Cassetti
American School for the Deaf
West Hartford, Connecticut

L. D. Cobb
General Supervisor
Western Union
Chattanooga, Tennessee

Andrew Conrad
Rhode Island School for the Deaf
Providence, Rhode Island

Tom Cunningham
Regional Manager
Concord Electronics
Silver Springs, Maryland

Gary H. Curtis
American School for the Deaf
West Hartford, Connecticut

Leonard Deloteus
Manager
Crescent Radio
Bowling Green, Kentucky

Dick Groff
Gallaudet College
Washington, D. C.

Louise Hammett
Alabama School for the Deaf
Talladega, Alabama

Lloyd Harrison
Superintendent
Missouri School for the Deaf
Fulton, Missouri

Joel R. Hoff
Florida School for the Deaf
St. Augustine, Florida

Ben Hoffmeyer
Superintendent
North Carolina School for the Deaf
Morganton, North Carolina

James T. Johnson
Governor Morehead School for the Deaf
Raleigh, North Carolina

Robert LaGow
Midwest Regional Media Center
for the Deaf
The University of Nebraska
Lincoln, Nebraska

Matt R. Long
C. E. S. Company
Knoxville, Tennessee

Ralph Miller
C. E. S. Company
Knoxville, Tennessee

Helen Miscaka
University of Kentucky SEIMC
Media Specialist
Lexington, Kentucky

Jim Mollier
G. E. TV
Atlanta, Georgia

Robert Newby
Director, Instructional Materials
Pennsylvania School for the Deaf
Philadelphia, Pennsylvania

Roy Parks
Superintendent
Arkansas School for the Deaf
Little Rock, Arkansas

E. C. Pledger
Georgia School for the Deaf
Cave Spring, Georgia

H. E. Ramey
Training Supervisor
Western Union
Chattanooga, Tennessee

Jon Rawleigh
National Technical Institute for the Deaf
Rochester, New York

Chris Reynolds
Audio Visual Director
Knoxville College
Knoxville, Tennessee

Catherine Riser
Alabama School for the Deaf
Talladega, Alabama

Norman Rolen
C. E. S. Company
Knoxville, Tennessee

H. G. Royall, Jr.
Principal
North Carolina School for the Deaf
Morganton, North Carolina

Fred Rusmisser
North Carolina School for the Deaf
Morganton, North Carolina

Tyge Salirg
Teacher
Schooi for the Deaf
Fredericia, Denmark

Walt Slater
Florida School for the Deaf
St. Augustine, Florida

Henry C. Smith
Pennsylvania School for the Deaf
Philadelphia, Pennsylvania

Ernest Strong
Principal
Alabama School for the Deaf
Talladega, Alabama

R. W. Webb, Jr.
Florida School for the Deaf
St. Augustine, Florida

Steve White
Clarke School for the Deaf
Northampton, Massachusetts

William D. Jackson
Director
Southern Regional Media Center for the Deaf
University of Tennessee
Knoxville, Tennessee

E. Jack Goforth
Southern Regional Media Center
University of Tennessee

James S. Howze
Southern Regional Media Center
University of Tennessee
Knoxville, Tennessee

Fred A. Miller
Southern Regional Media Center
University of Tennessee
Knoxville, Tennessee

W. Lloyd Graunke
Superintendent
Tennessee School for the Deaf
Knoxville, Tennessee

Warren Flower
Principal
Tennessee School for the Deaf
Knoxville, Tennessee

Robert Gonzales
Director, Teacher Training
Department of Special Education
University of Tennessee
Knoxville, Tennessee

E. Kendall Hanks
Kansas School for the Deaf
Olathe, Kansas